

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF ALABAMA
NORTHERN DIVISION

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| AUTOLIV ASP, INC., |) | |
| |) | |
| Plaintiff, |) | |
| |) | |
| v. |) | Case No. 2:13-cv-141-WKW-SMD |
| |) | |
| HYUNDAI MOBIS CO., LTD. and |) | |
| MOBIS ALABAMA, L.L.C., |) | |
| |) | |
| Defendants. |) | |

RECOMMENDATION OF THE MAGISTRATE JUDGE

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I. INTRODUCTION

This is a patent infringement case. Plaintiff Autoliv ASP, Inc. (“Autoliv”) holds two patents in which it claims several inventions for making automotive airbag deployment safer. Defendants Hyundai Mobis Co. Ltd. (“Hyundai”) and Mobis Alabama, L.L.C. (“Mobis”) manufacture airbags and sell them as parts of automobile safety systems. In 2013, Plaintiff Autoliv initiated this action against Defendant Hyundai and Defendant Mobis under 35 U.S.C. §§ 271, 281, seeking an injunction against future acts of alleged infringement, compensatory damages, and multiple damages for willful infringement. *Compl.* (Doc. 1). In their Answer and Counterclaims, Defendants denied the allegations and countersued for declarations of non-infringement and invalidity of the patent. *Answer* (Doc. 20).

The District Judge referred this matter to a prior Magistrate Judge for consideration and disposition or recommendation of all pretrial matters, including dispositive motions. (Doc. 27). The case was reassigned to the undersigned on September 14, 2020. After two, separate inter partes review proceedings at the Patent Trial and Appeal Board (“PTAB”) of the United States Patent and Trademark Office (“PTO”) and appeals to the United States Court of Appeals for the Federal Circuit, a claim construction proceeding before this Court, discovery, and other litigation, the matter now comes before the undersigned for recommendation on cross motions for summary judgment. (Docs. 200, 201).

After reviewing the submissions of the parties and hearing oral arguments, the undersigned Magistrate Judge RECOMMENDS that Plaintiff Autoliv’s Motion for Partial Summary Judgment (Doc. 200) be GRANTED and that Defendant Hyundai’s and

Defendant Mobis's Motion for Summary Judgment of Non-Infringement and No Enhanced Damages (Doc. 201) be GRANTED IN PART and DENIED IN PART.

II. BACKGROUND

A. Narrowing the Issues

In its Complaint, Autoliv alleges that automotive safety airbags produced by Defendants infringe claims of U.S. Patent No. 7,347,450 (filed March 25, 2008) (the '450 Patent) issued to Williams and others and assigned to Autoliv and U.S. Patent No. 7,614,653 (filed November 10, 2009) (the '653 Patent) issued to Rose and others and assigned to Autoliv. *Compl.* (Doc. 1). The accused devices are airbags and airbag cushion assemblies made and sold by Hyundai and Mobis for inclusion in automotive safety systems.

During nearly eight years of litigation, different tribunals have narrowed the issues in this dispute. A brief review of this litigation history will help frame the analysis of the issues that remain to be resolved. In the inter partes review proceedings, Defendants challenged the novelty and non-obviousness of Autoliv's patents. In two separate claim construction deliberations, the Court considered and rejected several proposed technical and particular constructions of the relevant claim terms, instead rendering the terms according to their plain and ordinary meanings. (Docs. 108, 131). The Court also entered an order estopping Defendants from raising invalidity challenges that they either brought or could have brought earlier. (Doc. 204). Finally, the parties have entered, pursuant to Federal Rule of Civil Procedure 41(a)(1)(A)(ii), a Joint Stipulation of Dismissal,

stipulating that allegations of infringement of certain patent claims by certain accused devices are dismissed with prejudice. (Doc. 242).

B. Inter Partes Review Proceedings

Shortly after Autoliv filed this action, Hyundai and Mobis filed petitions at the PTO asking the PTAB to perform inter partes review of the '450 and '653 patents pursuant to 35 U.S.C. § 314. *Hyundai Mobis Co. v. Autoliv ASP, Inc.*, IPR No. 2014-01005, Paper No. 2 (P.T.A.B. June 24, 2014) [hereinafter *Hyundai I*¹]; *Hyundai Mobis Co. v. Autoliv ASP, Inc.*, IPR No. 2014-01006, Paper No. 2 (P.T.A.B. June 24, 2014) [hereinafter *Hyundai II*²]. The PTAB granted both petitions to review validity, specifically whether the inventions claimed in Autoliv's patents are non-obvious as 35 U.S.C. § 103 requires. *Hyundai Mobis Co. v. Autoliv ASP, Inc.*, IPR No. 2014-01005, Paper No. 10 (P.T.A.B. Jan. 14, 2015); *Hyundai Mobis Co. v. Autoliv ASP, Inc.*, IPR No. 2014-01006, Paper No. 12 (P.T.A.B. Jan. 13, 2015). The PTAB reviewed the patentability of relevant claims of the '450 Patent in Case IPR2014-01005 and of the '653 Patent in Case IPR2014-01006. This Court stayed proceedings while the parties litigated at the PTAB. (Doc. 62).

After submission of evidence and oral hearings, the PTAB issued final written decisions in both cases pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. *Hyundai Mobis Co. v. Autoliv ASP, Inc.*, IPR No. 2014-01005, Paper No. 54 (P.T.A.B. Jan. 6, 2016); *Hyundai Mobis Co. v. Autoliv ASP, Inc.*, IPR No. 2014-01006, Paper No. 48 (P.T.A.B. Jan. 6, 2016). The disappointed party in each case appealed to the United States Court of

¹ *Hyundai I* refers to all PTAB decisions for case IPR No. 2014-01005.

² *Hyundai II* refers to all PTAB decisions for case IPR No. 2014-01006.

Appeals for the Federal Circuit, which affirmed the decision in *Hyundai I* and affirmed in part and reversed in part the decision in *Hyundai II. Autoliv ASP, Inc. v. Hyundai Mobis Co., Mobis Alabama, L.L.C.*, No. 2016-1896 (Fed. Cir. Mar. 7, 2017); *Autoliv ASP, Inc. v. Hyundai Mobis Co., Mobis Alabama, L.L.C.*, 685 Fed. App'x. 962 (Fed Cir. 2017).

In *Hyundai I*, the PTAB ruled that the relevant '450 Patent claims are not unpatentable. *Hyundai I*, Paper No. 54 at 28. In their petition, Hyundai and Mobis relied upon nine prior art references. *Hyundai I*, Paper No. 2 at 13-15. The PTAB conducted a non-obviousness review based upon combinations of five of them. *Hyundai I*, Paper No. 10 at 13-42. They are patents JP H05-85295 ("Inoue"), DE 100 59 956 ("Narin"), US 2004/0012179 A1 ("Pinsenschaum"), US 5,405,166 ("Rogerson"), and US 2004/0056459 A1 ("Kassman"). The PTAB read the '450 Patent over four combinations: Inoue and Narin; Inoue, Narin, and Pinsenschaum; Inoue, Narin, Pinsenschaum, and Rogerson; and Inoue, Narin, Pinsenschaum, and Kassman. *Hyundai I*, Paper No. 10 at 13-42.

The PTAB found that, like the contested claims of the '450 Patent, Inoue and Narin disclosed elements specified to solve the problem of safe airbag deployment. *Hyundai I*, Paper No. 54 at 16-18. But Inoue and Narin disclosed different solutions than that disclosed in the '450 Patent. *Id.* at 19-27. And the PTAB found no "sufficient explanation or credible evidence" that the solution disclosed in the '450 Patent "would be the expected or predictable result" of prior art elements disclosed in Inoue and Narin. *Id.* at 22-27. It also found that no other references, including Pinsenschaum, Rogerson, and Kassman, would render the contested limitations in the '450 Patent obvious. *Id.* at 27-28. The Federal Circuit

affirmed the PTAB's decision *per curiam* and without opinion. *Autoliv ASP, Inc. v. Hyundai Mobis Co., Mobis Alabama, L.L.C.*, No. 2016-1896 (Fed. Cir. Mar. 7, 2017).

In *Hyundai II*, the PTAB ruled that key elements of contested claims in the '653 Patent would be obvious to one skilled in the relevant art, within the meaning of 35 U.S.C. § 103(a). *Hyundai II*, Paper No. 48. In addition to Inoue and Pinsenschaum, the PTAB considered two prior art references, patent US 5,280,953 ("Wolanin") and patent JP 2003-137060 A ("Tajima"), while declining to consider three other prior art references proffered by the petitioners. *Id.* at 6-7. It read relevant provisions of the '653 Patent over two prior art combinations: Inoue, Pinsenschaum, and Wolanin; and Inoue, Pinsenschaum, Wolanin, and Tajima. *Id.* at 7.

The PTAB ruled that one with ordinary skill in the relevant art—engineering of automotive protective systems—would have combined elements of Inoue, Pinsenschaum, and Wolanin to render obvious key limiting elements of claims 1-3, 6, 20-22, 25, and 28-30 in the '653 Patent. *Id.* at 27. It also ruled that elements of Tajima and Inoue, if modified in light of Pinsenschaum and Wolanin, would render obvious a key element of claims 26, 33, 35-37, and 40 in the '653 Patent. *Id.* at 40. It ruled all of those claims unpatentable. *Id.*

The Federal Circuit affirmed the PTAB decision with respect to claims 1-3, 6, 20-22, 25, and 28-30. *Autoliv ASP, Inc. v. Hyundai Mobis Co., Mobis Alabama, L.L.C.*, 685 Fed. App'x. 962, 966 (Fed Cir. 2017). But it reversed with respect to claims 26-27, 33-37, and 40, because substantial evidence did not support the PTAB's obviousness findings. *Id.* The Federal Circuit explained that the PTAB read into the prior art two

anticipating disclosures that are not present, and which indeed are contrary to the express teachings of the prior art disclosures. *Id.* at 965-66. That led the PTAB to err in finding two limitations of the '653 Patent obvious. *Id.* at 966.

In sum, the inter partes reviews and appeals establish that all of the contested claims of the '450 Patent and claims 26-27, 33-37, and 40 of the '653 Patent are valid and non-obvious over the prior art proffered by Defendants, while claims 1-3, 6, 20-22, 25, and 28-30 of the '653 Patent are obvious and therefore unpatentable. In their Joint Statement of Uncontested Facts, the parties stipulate that Autoliv is now asserting infringement of claims 1-2, 6, 8-10, and 20 of the '450 Patent, and claims 26, 27, 35-37, and 40 of the '653 Patent (collectively, the "Withdrawn Claims"). *Statements of Uncontested Facts* (Doc. 210-2) p. 9. The undersigned considers all of the other claims withdrawn.

C. Claim Construction and Estoppel

This Court lifted the stay after the inter partes review proceedings and appeals were completed. (Doc. 89). In a series of recommendations and rulings, the Court has since resolved issues of claim construction and the preclusive effect of the PTAB and Federal Circuit rulings. In 2018, in response to the "lone remaining dispute concerning the construction of claim terms," the Court rendered a claim construction that the last contested term be given its ordinary and customary meaning ("First Claim Construction"). (Doc. 108) pp. 1-2; (Doc. 112).

In 2019, Defendants asked for new claim constructions. (Doc. 123). In ruling on that motion, this Court construed one term, "cinch tube," to mean "a tubular structure having opposing open ends separated by a length of material and capable of being cinched

at least partially closed.” (Doc. 131) p. 6. Finding that Defendants enjoyed “ample time and opportunity” to raise claim construction disputes earlier, the Court rejected Defendants’ proposed constructions and ruled that all other contested terms be given their plain and ordinary meanings (“Second Claim Construction”). *Id.* at 6-7.

On March 9, 2020, this Court entered an Order to Preclude Evidence and Argument Relating to Invalidity Challenges (“Estoppel Order”). (Doc. 204). Because a party who successfully petitions the PTO for inter partes review is estopped from later raising invalidity grounds that it “raised or reasonably could have raised during that inter partes review,” 35 U.S.C. § 315(e)(2) (emphasis added), this Court ruled that “Mobis is estopped pursuant to 35 U.S.C. § 315(e) from pursuing any prior art grounds with respect to claims 26-27, 35-37, and 40 of the ’653 Patent” and “from pursuing any prior art grounds for the ’450 Patent other than those explicitly listed” in the Estoppel Order. (Doc 204) p. 2. The remaining grounds are new combinations of the same prior art (e.g., Inoue, Wolanin) that Defendants presented to the PTAB during inter partes review. Defendants propose to read them over the same contested claims of the ’450 Patent. The list contains three prior art combinations read over claims 1, 2, 6, and 20 of the ’450 Patent; twenty-five combinations read over claims 4 and 14; ten combinations read over claims 8, 9, 11, 12, 16, and 18; and twenty combinations read over claims 10 and 19. *Id.* at 2-4.

III. UNCONTESTED FACTS

A. The Patented Inventions

With respect to the allegations and claims that remain, the summary judgment record establishes certain material facts beyond dispute. The ’450 and ’653 patents recite

inventions that make airbags deploy more safely than earlier airbags. Full inflation of an airbag is not always desirable in an automobile accident. As the specification in the '653 Patent explains, partial inflation is preferable “when the occupant being protected by the airbag cushion is a child, a baby in a rear facing car seat or an adult positioned too close to the airbag cushion. Such positions are referred to as out-of-position conditions.” '653 Patent at col. 2 l. 66 to col. 3 l. 4. The inventions are embodied in a “cushion that responds to an occupant’s position and vents accordingly to avoid excessive deploying impact.” *Id.* at col. 3 ll. 5-7.

Similarly, the preferred embodiments of the '450 Patent result in airbags that “provide improved safety by deploying with less pressure when an occupant is obstructing deployment. The airbag cushions deploy with more pressure when an occupant is not obstructing deployment and when high pressure is required to provide the necessary restraint.” '450 Patent at col. 4 l. 65 to col. 5 l. 3.

1. The '450 Patent

a. The Problem and the Solution

The '450 Patent discloses an airbag cushion that inflates fully if the passenger is in the proper position, but vents gas to prevent full deployment if the airbag encounters a passenger who is out of position. It accomplishes this feat using a venting tube that can be closed, called a “cinch tube,” and a cinch cord that closes the tube when the airbag does not encounter an out-of-position occupant. '450 Patent at col. 2 ll. 10-21. The cinch tube remains open if the airbag encounters an obstruction, and gas vents out through the tube, preventing full inflation. *Id.* at col. 2 ll. 12-15. But if the airbag encounters no obstruction

while deploying, a cinch cord attached to the inside of the cushion at one end and the cinch tube at the other extends to its full length. *Id.* at col. 2 ll. 15-18. The cinch cord, which “circumvents a majority of the perimeter of the cinch tube,” closes the cinch tube when it becomes taut by pulling the outward end of the tube inward and cinching it shut, thus obstructing the escape of venting gas and causing the cushion to inflate fully. *Id.* at col. 2 ll. 60-67.

This invention solves a difficult problem. As an airbag inflates, the pressure of the inflating gas pushes the folded bag’s membrane outward. When the airbag is fully inflated, the membrane’s surface is in tension. The problem is how to close a vent hole in the membrane in spite of that surface tension. To pinch or fold the membrane would require overcoming the surface tension of the airbag. If the vent holes are not closed, the surface tension will dissipate, but gas will escape and the airbag will not fully inflate. All the forces are conspiring to push open a vent hole in the membrane of the airbag just at the moment when the hole should be closed in order to obstruct the flow of escaping gas and achieve full inflation.

The claims of the ’450 Patent solve this problem with a cinch tube that has a length running orthogonal to the surface of the airbag membrane. ’450 Patent at figs.2A, 2B, 3, 4. What the patent refers to as the “base end” of the tube “is coupled to a surface of the airbag cushion and circumvents an aperture in the surface.” *Id.* at col. 2 ll. 34-36. This aperture and attached base end of the tube remain open during full deployment, while the cinch cord cinches closed the outer part of the cinch tube and pulls it inward toward the interior of the airbag. *Id.* at figs.2B, 5C, 7.

b. Terminal End of the Tube

The end of the tube opposite to the base end, to which the cinch cord is coupled and which it cinches shut during full deployment, is called the “terminal end.” ’450 Patent at col. 5 ll. 22-32. The relevant claims of the ’450 Patent either contain this limiting element or depend from claims that do. For example, claim 1 recites in part “a cinch tube having a base end opposite from a terminal end, wherein the terminal end has an aperture; and a cinch cord coupled to the terminal end of the cinch tube and extending around a majority of the aperture of the terminal end of the cinch tube.” ’450 Patent at col. 5 ll. 22-26. The balance of this Recommendation refers to this claim element as the “Terminal End Limitation.”

c. Inversion of the Cinch Tube

Because the tube is fabric, the terminal end of the tube may either open outside the airbag or be pulled inside by the cinch cord, which is attached to it. When the cinch cord is slack, the terminal end of the tube opens outward and allows gas to escape. ’450 Patent at figs.5E, 5F. When the cord becomes taut, it inverts the tube, pulls it inward, and restricts its aperture by cinching it, obstructing the escaping gas. *Id.* at figs.5B, 5C. Claim 1 and other relevant claims describe this limitation as the operation

wherein the configuration of the cinch tube and the length of the cinch cord enables the aperture to at least partially close, upon inflatable airbag deployment without obstruction, such that the terminal end is at least partially within the interior of the inflatable airbag cushion after the aperture becomes at least partially closed.

Id. at col. 5 ll. 38-44. This inward pull works against the building pressure until the tube inverts; it is assisted by the pressure after inversion. *Statements of Uncontested Facts*

(Doc. 210-2) p. 2. The remainder of this Recommendation refers to this claim element as the “Inversion Limitation.”

The Inversion Limitation was “against conventional wisdom” at the time of the invention and contrary to the prior art, which taught vents that close outside the airbag membrane. *Id.* In particular, the PTAB found that Narin recites a “nozzle” that “closes *on the outside of the airbag.*” *Hyundai I*, Paper No. 54 at 19. If the nozzle disclosed in Narin were to invert, “[a]t most, the terminal end would be folded within *the interior of the nozzle.*” *Id.* at 20. But the PTAB did not find that inversion of the nozzle performs any work in Narin’s nozzle. Rather, control is “provided by *the folding in the area of the fabric nozzle.*” *Id.* The Inversion Limitation of the ’450 Patent is therefore an innovative break from the prior art.

d. Without Necessitating Base End Closure

Meanwhile, as the terminal end of the cinch tube inverts and closes, the base end of the tube can remain open. The base end need not overcome the surface tension of the airbag membrane because the terminal end restricts the flow of gas, allowing the base end to remain open. Claim 1 expresses that “the cinch tube is configured such that the aperture at the terminal end at least partially closes, upon inflatable airbag deployment without obstruction, without necessitating closure of the base end of the cinch tube.” Patent ’450 at col. 5 ll. 33-37. The parties refer to this last limitation as the “Base End Closure” Limitation. (Doc. 206-1) p. 3; (Doc. 219) p. 3.

2. *The '653 Patent*

a. *Fold of the Membrane*

The '653 Patent discloses an airbag cushion that directs gas out through closeable vents when the deploying cushion encounters an obstruction. It employs a “control cord” to close the vents. '653 Patent at col. 3 l. 13. If the airbag encounters no obstructions, the cord becomes taut, the vents close, and the bag fully inflates. Until full inflation, or if the deploying cushion encounters an out-of-position passenger, an inward fold in the cushion membrane maintains slack in the control cord to keep the vents open. Claim 35 expresses that “the cord is anchored to the cushion membrane at a region of the cushion membrane which is folded to have at least one fold, and wherein the fold is held in place by a releasable temporary holding feature.” *Id.* at col. 12 ll. 64-67. The balance of this Recommendation calls this the “Fold Limitation.”

b. *Held by a Stitch*

Different claims in the patent presuppose different means of holding the fold in place until inflation. The device expressly recited in claim 20 is described in the relevant claims as “stitching.” '653 Patent at col. 11 ll. 57-58. It is further described in the specification as a “tack stitch.” *Id.* at col. 2 l. 47. The balance of this Recommendation calls this the “Stitch Limitation.”

c. *Diffuser*

Some of the '653 Patent's claims recite an optional diffuser. It is “configured to redirect inflation gas” toward the closeable vents “such that the gas rapidly exits the inflatable airbag cushion” when the inflating bag meets an obstruction. *See, e.g.,* '653

Patent at col. 12 ll. 6-9, 60-63. The parties refer to this as the “Diffuser Limitation.” (Doc. 202) p. 3.

d. Fixed Vent

Claims 27, 37, and 40 of the ’653 Patent, which all depend from other claims, add the limitation “further comprising a fixed vent disposed on the airbag and adapted to vent gas during airbag deployment with and without obstruction.” *See, e.g.*, ’653 Patent at col. 12 ll. 10-12. The remainder of this Recommendation calls this the “Fixed Vent Limitation.” The specification states that the fixed vent is optional in different embodiments “based on venting requirements.” *Id.* at col. 6 ll. 9-10. It explains that fixed vents “provide consistent venting of the airbag cushion and are not restricted by an occupant’s position.” *Id.* at col. 6 ll. 4-6. It describes fixed vents as “typically smaller” than closeable vents. *Id.* at col. 6 l. 8.

B. The Accused Devices

1. First Generation and Redesigned Airbags

Autoliv alleges that Hyundai and Mobis have “made, used, offered to sell, sold, and/or imported into the United States airbags” that infringe the ’450 and ’653 Patents. *Compl.* (Doc. 1) pp. 3, 5. Autoliv alleges that Defendants continued to infringe after Autoliv provided notice of the patents and the alleged infringement on February 1, 2012, and that the acts of infringement since that date are willful. *Answer* (Doc. 20) pp. 4, 5.

For analysis of the infringement issues, the parties divide the accused devices into two groups: the “First Generation Airbags”;³ and the “Redesigned Airbags.”⁴ (Doc. 202) p. 4; (Doc. 206-1) p. 7. Both groups of airbags use cinch tubes to allow gas to escape when a passenger is out of position and use cinch cords to pull the tubes inward and cinch them shut when an airbag meets no obstruction.

2. Guide Mesh

The accused products incorporate an element called a “guide mesh” just inside each airbag’s venting hole, which the base end of the cinch tube circumvents. *Statements of Uncontested Facts* (Doc. 210-2) pp. 3, 7-8. The guide mesh consists of two strips of fabric that cross the vent hole just inside the theoretical plane of the airbag cushion membrane and intersect at a right angle. As the cinch tube is inverted or pulled inward toward the center of the airbag, the guide mesh arrests its progress, exerting outward pressure on the terminal end of the tube as the cinch cord exerts inward pressure on it. *Id.* at 3, 7-9, 15.

3. Differences in Accused Products

The accused airbags differ in three relevant respects. First, some but not all use diffusers to direct gas toward vents. *Statements of Uncontested Facts* (Doc. 210-2) pp. 13, 20. Thus, the Diffuser Limitation of the ’653 Patent need not be read over all of

³ For purposes of this Recommendation, the term “First Generation Airbags” refers to Defendants’ passenger airbag (“PAB”) model numbers 84530-3X500, and 84530-3X600.

⁴ For purposes of this Recommendation, the term “Redesigned Airbags” refers to Defendants’ PAB model numbers 84530-F2500, 84530 F3500, 84530-G2500, 84530-G2600, 80310-M6000, 80310-M7000, 84530-G5500, 84530-G5600, 80310-Q4500, 84530-A5500, 84530-D5600, 84530-D5500, 84530-3T600, 84530-C2500XX, 84530-C2500, 84530-G3600, 84530-B2500, 84530-E4500, 80300-J6000, 84530-H9500, 84530-H8500, 80310-S2000, 84530-A7500, 84530-A7600, 84530-A7700, 84530-A7800, and 84530-A9500.

them. Second, whereas in the First Generation Airbags the cinch cord attached to the cinch tube near the outermost edge of the terminal end of the tube, the Redesigned Airbags add additional fabric to the tube beyond where the cinch cord attaches to the tube. And the cinch cord crosses at a different angle. In the First Generation Airbags, the cinch cord circumvents the terminal end of the cinch tube at a right angle to the aperture. In the Redesigned Airbags, by comparison, the cinch cord intersects the cinch tube at an oblique angle, such that the cord contacts the tube closer to the base end on one side of the tube than on the other. *Id.* at 4, 19.

Third, the cinch tubes are shaped differently and behave differently when cinched due to different configurations of the guide mesh. In the First Generation Airbags, the guide mesh that intersects the vent hole consists of two fabric strips that cross at right angles in the shape of a plus sign, “+.” *Id.* at 19. The cinch cord passes through a small hole at the center of the intersection of those strips. The cord is centered in the vent hole, where it passes through the guide mesh and pulls the tube down the center of the opening when closing, such that the tube inverts within itself when cinched. Where the cinch cord attaches to the terminal end of the cinch tube, it circumvents the tube at a right angle to the length of the tube. *Id.* at 20.

In the Redesigned Airbags, the guide mesh is comprised of two fabric strips that form an off-center crossing in the shape of the letter “T.” *Id.* at 19. The cinch cord passes through a small hole at the intersection and thus pulls the cinch tube down at an angle rather than down the center of the vent hole. One side of the cinch tube, opposite to where the cinch cord passes through the guide mesh, is longer than the other. This long side gets

folded down over the vent hole as the cinch cord pulls inward on the cinch tube, for the cinch tube intersects the tube at an oblique angle and is attached closer to the terminal end on the long side than it is on the short side. *Id.* at 19-20.

IV. LEGAL STANDARDS

Summary judgment is appropriate when “there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” FED. R. CIV. P. 56(a). When the nonmoving party bears the burden of proof at trial, summary judgment is warranted if the nonmovant fails to “make a showing sufficient to establish the existence of an element essential to [its] case.” *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986). The legal elements of a claim determine which facts are material and which are irrelevant. *Anderson v. Liberty Lobby*, 477 U.S. 242, 248 (1986). A fact is not material if a dispute over that fact would not affect the outcome of the case under the governing law. *Id.*

A court must view the proffered evidence in the light most favorable to the nonmovant and resolve all reasonable doubts about the facts in the nonmovant’s favor. *Johnson v. Bd. of Regents of Univ. of Ga.*, 263 F.3d 1234,1242-43 (11th Cir. 2001). To grant summary judgment of noninfringement, a court must determine, after resolving reasonable factual inferences in favor of the patentee, that no reasonable jury could find infringement. *See, e.g., Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 559 F.3d 1308, 1312 (Fed. Cir. 2009); *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1429 (Fed. Cir. 2000).

Here, the cross motions for summary judgment raise issues of infringement, enhanced damages, and obviousness of the patent claims. The motions do not raise any

disputes about the patentability of subject matter under 35 U.S.C. § 101 or novelty under 35 U.S.C. § 102. Insofar as some of Defendants' arguments might be understood to challenge the sufficient definiteness of the patent disclosures under 35 U.S.C. § 112, those arguments are untimely. Having challenged the patentability of Autoliv's patent claims at the PTO, Defendants may not now challenge validity of the patents "on any ground that" they "raised or reasonably could have raised during that inter partes review." 35 U.S.C. § 315(e)(2).

A patent is invalid for obviousness if any differences between the claimed invention and the relevant prior art "are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains." 35 U.S.C. § 103. Obviousness is a question of law that rests on underlying facts. *Graham v. John Deere Co. of Kansas City*, 383 U.S.1, 17-18 (1966). The burden of proving obviousness rests upon Defendants, who must demonstrate invalidity by clear and convincing evidence, for a patent is presumed to be valid under 35 U.S.C. § 282. *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011). Congress declared and codified the common law's "heavy burden of persuasion" on any person challenging the validity of an issued patent. *Id.* at 102.

As its counsel confirmed during oral argument, Autoliv argues only literal infringement. It does not at this stage assert infringement under the doctrine of equivalents. This simplifies the analysis. "A literal patent infringement analysis involves two steps: the proper construction of the asserted claim and a determination as to whether the accused method or product infringes the asserted claim as properly construed." *Vitronics Corp. v.*

Conceptronic, Inc., 90 F.3d 1576, 1581-82 (Fed. Cir. 1996). The first inquiry, claim construction, is a question of law. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996).

The second question, infringement, is one of fact. *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1339 (Fed. Cir. 2001). A finding of literal infringement requires that every limitation within a claim is found in the accused device. *In Re Gabapentin Pat. Litig.*, 503 F.3d 1254, 1259 (Fed. Cir. 2007). When both parties move for summary judgment, each motion is considered on its own merits and all reasonable inferences are resolved against the party whose motion is under consideration on any particular issue. *Gart*, 254 F.3d at 1338-39. The moving party is entitled to summary judgment of infringement or noninfringement if “no reasonable jury could find that every limitation recited in the properly construed claim either is or is not found in the accused device.” *Id.* at 1339.

To resolve both issues of infringement and questions of non-obviousness, the Court must construe the claims of the asserted patent, whose meaning is a question of law. *Markman*, 517 U.S. at 372. The “most significant source” of meaning of a disputed claim term or element is intrinsic evidence, which consists of the claims and specification and, if in evidence, the prosecution history. *Id.* at 1582; *E.I. du Pont De Nemours & Co. v. Unifrax I LLC*, 921 F.3d 1060, 1068 (Fed. Cir. 2019). The inter partes proceedings described above are part of the prosecution history, and thus part of the intrinsic evidence. *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1361 (Fed. Cir. 2017).

Though fact findings predicated on extrinsic evidence may be necessary to construe technical terms or terms of art that had a particular meaning to those skilled in the relevant

art at the time of patent prosecution, expert testimony and other extrinsic evidence do not determine the legal construction of the patent. *Winans v. New York & E.R. Co.*, 62 U.S. 88, 100-01 (1858). If extrinsic evidence is necessary, then expert testimony may help a judge to understand as a matter of fact “the background science or the meaning of a term in the relevant art during the relevant time period.” *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015). The Court must then decide “whether a skilled artisan would ascribe that same meaning to that term *in the context of the specific patent claim under review.*” *Id.* at 332. That analysis is a question of law for the Court. *Id.*

V. DISCUSSION

Neither party has moved for summary judgment on all remaining issues. Instead, the parties seek a ruling on several discrete propositions. In its Motion for Partial Summary Judgment, Autoliv argues for six propositions, five of them relate to the non-obviousness and validity of its patents. (Doc. 200). The sixth proposition is that the accused products infringe the Base End Closure limitation of the '450 Patent. *Id.* at 2.

In their Motion for Summary Judgment, Hyundai and Mobis ask for summary judgment on eleven propositions. (Doc. 201). Ten of them are various lists of accused products that do not infringe various claim limitations of Autoliv’s patents. *Id.* at 1-3. The eleventh is that Autoliv is not entitled to enhanced damages for willful infringement. *Id.* at 3.

All seventeen propositions can be organized into three groups. First, Autoliv argues that its remaining patent claims are definite, non-obvious, and therefore patentable. Second, all infringement issues can be discussed together. Many of the contested claim limitations

appear in multiple claims or are incorporated in dependent claims. And many of the accused products have features in common. So, reading a few, contested limitations over sets of accused devices makes it possible to dispose of multiple infringement disputes at a time. Third, Defendants argue that multiple damages are unwarranted as a matter of law.

A. Autoliv's Remaining Patent Claims Are Valid as a Matter of Law

1. The Terms of the '653 Patent Are Definite

Defendants argue that the term “region” in the Fold Limitation and “such that the gas rapidly exits” in the Diffuser Limitation are indefinite. *Def.'s Opp'n to Summ. J.* (Doc. 219) pp. 14, 18. Defendants could have pressed a definiteness challenge under 35 U.S.C. § 112 during inter partes review. Throughout this years-long litigation the PTAB, the Federal Circuit, the attorneys, and the expert witnesses have proceeded on the understanding that these terms, like the others at issue in this case, should be given their plain and ordinary meaning. Indeed, during inter partes review, Defendants construed both terms without difficulty. *Hyundai II*, Paper No. 6 at 25, 54. And they successfully persuaded the PTAB to interpret “such that the gas rapidly exits” to mean that the diffuser enables the cinch tubes “to more readily exhaust excess gas.” *Hyundai II*, Paper No. 48 at 33.

Alternatively, Defendants' argument might be designed to introduce new claim constructions into the case. But taken together, the First and Second Claim Construction rulings hold that new or technical constructions are not permitted at this stage. Defendants have enjoyed many opportunities to introduce alternative constructions and to cast the claim terms in unclear lights. They may not make another attempt now.

Even if Defendants were not estopped from challenging definiteness and proposing new claim constructions at this late hour, their argument fails as a matter of law. Like the attorneys and experts, the undersigned has no difficulty discerning the plain and ordinary meanings of these terms. Especially when viewed in light of the specifications, the terms of the '653 Patent “inform those skilled in the art about the scope of the invention with reasonable certainty.” *In Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 898-99 (2014).

“Generally, there is a ‘heavy presumption’ in favor of the ordinary meaning of claim language as understood by one of ordinary skill in the art.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1268 (Fed. Cir. 2001). The presumption is overcome either when the patentee chooses to be his own lexicographer, *id.*, or “where the term or terms chosen by the patentee so deprive the claim of clarity that there is no means by which the scope of the claim may be ascertained from the language used.” *Johnson Worldwide Assocs. v. Zebco Corp.*, 175 F.3d 985, 990 (Fed. Cir. 1999). The PTAB and Federal Circuit were both able to ascertain the scope of the contested claims from the language used, and the meaning of those claims is no less clear when read over Defendants’ accused devices.

The term “region” in the Fold Limitation signifies that the cord need not be attached at the base of the fold, but may be attached nearby. The term “rapidly” is similarly plain. The PTAB construed the Diffuser Limitation’s function as being “to more readily exhaust excess gas” by means of a diffuser that redirects the gas toward the closeable vents. *Hyundai II*, Paper No. 48 at 33, 35. In context, therefore, the term “rapidly” means that the

gas flows more readily or easily toward the closeable vents than it might without redirection by the diffuser.

Extrinsic evidence confirms these plain meanings. Defendants' expert, Margaret Andreen ("Andreen") interpreted the terms without difficulty and without using technical terms of art. (Doc. 183-1) pp. 62-63. She indicated that "region" means near the base of the fold but not necessarily exactly there. And she testified that the diffuser enables gas to exit rapidly because when it is aligned with the cinch tubes, the "tubes are open" as the "gas is leaving the cinchable tubes." *Id.* at 63. That the patent does not state an exact rate in mathematical terms does not render the term "rapidly" indefinite, as it is a term of degree and not a term of art. Ms. Andreen expressed that "'rapidly' is a relative term." *Id.*

2. *The '450 Patent Is Non-Obvious as a Matter of Law*

Autoliv "moves for summary judgment that all claims of the Asserted Patents are non-obvious, on all grounds for which Mobis" and Ms. Andreen "failed to provide any evidence in support of a motivation to combine." (Doc. 206-1) p. 24. In particular, Autoliv argues that prior art disclosing parachute technologies is not analogous as a matter of law. *Id.* at 26. Three of Defendants' proffered prior art publications describe parachutes. They are Riedinger (1921), Nonaka (1938), and Horning (1950). *Id.*

Ms. Andreen relies on ten combinations of prior art. *Andreen Report* (Doc. 209-4). These are (1) Inoue and Nonaka; (2) Inoue and Riedinger; (3) Inoue and Nonaka or Riedinger, with Narin; (4) Inoue and Nonaka or Riedinger, with Horning; (5) Inoue and Wolanin; (6) Inoue and Pinsenschaum; (7) Inoue and Rogerson; (8) Inoue and Schneider; (9) Inoue and Fischer; and (10) Inoue and Kassman. Each of those combinations either is

precluded by the Estoppel Order (Inoue and Pinsenschaum; Inoue and Wolanin; Inoue and Rogerson; any combination involving Horning, Schneider, or Fischer) or relies on one or both of two parachute publications, Nonaka and Riedinger. So, if the prior art disclosed in Nonaka and Riedinger is not analogous then Autoliv is entitled to judgment as a matter of law that the '450 Patent is non-obvious, as both the PTAB and Federal Circuit previously found.

Prior art is relevant to an obviousness determination only if it is analogous to the art disclosed in the patent. *Circuit Check Inc. v. QXQ Inc.*, 795 F.3d 1331, 1335 (Fed. Cir. 2015). “Prior art is analogous if it is from the same field of endeavor or if it is reasonably pertinent to the particular problem the inventor is trying to solve.” *Id.* Additionally, the party proffering the prior art must “demonstrate by clear and convincing evidence that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014).

Defendants proffered Riedinger and Nonaka to the PTAB during inter partes review. *Hyundai I*, Paper No. 2 at 6; *Hyundai I*, Paper No. 54 at 6. But the PTAB did not consider them as relevant prior art. *Hyundai I*, Paper No. 10 at 44; *Hyundai I*, Paper No. 54 at 7. The PTAB did not explain why it omitted Riedinger and Nonaka from its analysis except to say that it was exercising its discretion “to ensure timely completion of the instituted proceeding.” *Hyundai I*, Paper No. 10 at 44. But it is not difficult to discern why the PTAB did not consider parachute disclosures among the pertinent prior art. The parachute art is

neither from the same field of endeavor nor pertinent to the problem that Autoliv's invention solved. Neither does it suggest a reasonable expectation of success in resolving the problem of how to close an airbag vent without overcoming surface tension in the airbag membrane.

Defendants attempt to recharacterize that problem in terms so broad that parachutes might be relevant to its solution. *Def.'s Opp'n to Summ. J.* (Doc. 219) p. 23. They describe that problem as "controlling the venting behavior of airbags as they deploy under various occupancy conditions." *Id.* So framed, they continue, "the parachute prior art Autoliv objects to is clearly pertinent to this problem," for the techniques for venting gases through parachutes and through airbags are "essentially identical." *Id.* at 23-24. But "[t]hus framed," *any* prior art disclosing air vents in a fabric membrane would be pertinent.

Defendants erroneously frame the problem. The claims of the '450 Patent solve the problem how to *prevent* or *restrict* venting when the airbag is fully deployed and its surface is under tension, and they recite novel means to *close* the vent in those conditions. This conclusion is dictated by the plain meaning of the patent terms. The PTAB interpreted "cinch tube" as a "[m]eans for *venting gas out of the airbag*" and "cinch cords" as a "[m]eans for *restricting gas venting*." *Hyundai I*, Paper No. 54 at 12. In explaining why Inoue does not render the '450 Patent obvious, the PTAB observed that "Inoue explicitly discloses maintaining *the vent hole in an open position*." *Id.* at 25. In order to anticipate the '450 Patent, Inoue would have had to motivate one with ordinary skill to "*close the terminal end quickly to achieve maximal closure*." *Id.* at 26.

Those interpretations make clear that the problem solved by the '450 Patent is not how to vent gas, as Defendants argue, but how to close the aperture and prevent the venting of gas while the airbag membrane is under tension. As Defendants' own submissions show, the parachute art discloses devices to solve the *opposite* problem of how to *enable* or *facilitate* venting when the parachute is fully deployed and its surface is under tension, and recites means to *open* a vent or *enlarge* an opening. Nonaka recites the use of cords so that an "air escape port is enlarged" and Riedinger recites a means "so that the opening O is opened" when the parachute is deployed and "air pressure acting underneath the parachute" is pushing out against the membrane of the parachute canopy. (Doc. 219) p. 24.

Ms. Andreen did not connect those disclosures with the problem solved by the '450 Patent. In her deposition she testified that "[t]here are features of—of a parachute that are similar in function to those of an airbag." (Doc. 183-1) p. 19. When pressed to identify such features, she replied, "I don't profess to know all of the features of parachutes, so I don't know that I can answer that question appropriately. There might be some features that are the same, and I'm just not aware—aware of it." *Id.* at 20. The one similar feature she identified is an airbag "cinch tube," which "looked like a feature on a parachute." *Id.* She continued, "I do know that parachutes have this opening in the top that needs to be controlled in order to control the descent, and that opening has gas flowing through it just like a cinch tube." *Id.* at 20.

She was then asked what would happen to the gas pressure within a parachute if the top opening were to expand during a descent. She replied, "I would have to reread [Autoliv's expert's] report in order to answer that question. The—I'm not making these

comparisons with regards to pressure per se, but on opening and closing an aperture through which gas is flowing, and probably more specifically, closing.” *Id.* at 21. But she then conceded that the parachute prior art does not disclose means for closing a vent hole without overcoming surface tension. To the contrary, she testified, “When the cord of Nonaka is pulled, the air port at the top of the parachute opens.” *Id.* at 22. And she testified that Riedinger is to the same effect. *Id.* at 11.

Read in the light most favorable to Defendants, the undisputed evidence shows that the parachute art discloses the use of holes in the parachute canopy membrane as vents and the use of cords to open or enlarge the holes. But neither the use of cords to open vents nor the use of holes to vent gas out of an airbag was novel before the ’450 Patent issued. What was novel and non-obvious in the ’450 Patent is disclosure of a means to *restrict* gas venting during full inflation without having to overcome surface tension in the airbag membrane. The parachute publications do not, by themselves nor in combination with Inoue or other airbag art, direct one skilled in the relevant art to any solution to that problem. And they certainly do not suggest the particular solution disclosed in the ’450 Patent. No reasonable fact finder could find that the parachute art is analogous.

Even if parachute art were analogous, Ms. Andreen did not articulate a basis reasonably to expect success from the ten prior art combinations. She did testify that a person of ordinary skill in the art who read the parachute publications would discern how to “modulate an aperture size to adjust the airbag pressure to provide softer deployment for out-of-position occupants.” (Doc. 183-1) p. 15. When pressed to identify a reasonable expectation that combining those disclosures with other prior art would lead to success in

solving the problem how to close a vent in an inflated airbag, she replied simply that she would not have suggested the parachute publications “if it were not expected to be reasonably successful.” *Id.* at 16. Combining that *ipse dixit* with “common sense,” Defendants urge the Court to discover a fact question about reasonable likelihood of success. (Doc. 219) p. 27.

An expert’s conclusory assertion does not give rise to a genuine issue of material fact. *Yoon Ja Kim v. ConAgra Foods, Inc.*, 465 F.3d 1312, 1319-20 (Fed. Cir. 2006). An expert opinion that amounts to “impermissible hindsight” does not supply clear and convincing evidence of a reasonable expectation of success at the time of the invention. *InTouch Techs.*, 751 F.3d at 1348-49. Nor may an expert simply opine “that all of the elements of the claims disparately existed in the prior art”; she must “provide the glue to combine these references.” *Id.* Ms. Andreen does not show that the parachute publications suggested the successful solution that the ’450 Patent discloses, separately or in combination with other prior art.

Finally, Defendants are estopped from raising new validity challenges under 35 U.S.C. § 315(e). Defendants acknowledge that this Court’s Estoppel Order estops them from introducing prior art to challenge the validity of claims 26-27, 35-37, and 40 of the ’653 Patent. (Doc. 204). And Mobis states that it “will not present any prior-art-based invalidity” challenges to those claims. *Def.’s Opp’n to Summ. J.* (Doc. 219) p. 27. As review of the summary judgment submissions makes clear, Mobis is for the same reason also estopped from proffering any new prior art combinations to use against the ’450 Patent.

Defendants have run out of prior art combinations. Ms. Andreen identified the ten combinations of prior art listed above and no others. No additional prior art combination may now be introduced, and Autoliv is entitled to judgment that the '450 Patent is non-obvious as a matter of law.

B. Infringement Issues

Autoliv moves for summary judgment that Defendants' products infringe the Base End Closure Limitation as a matter of law. (Doc. 200). Defendants move for summary judgment that, as a matter of law, none of their products infringe the Inversion Limitation, Terminal End Limitation, Fixed Vent Limitation, Diffuser Limitation, and Stitch Limitation. (Doc. 201). The undersigned considers each issue in turn.

1. Accused Products Infringe the Base End Closure Limitation

a. Undisputed that Base End Does Not Cinch Closed

Autoliv first argues that all of Defendants' airbags infringe the Base End Closure Limitation, and that this is established as a matter of law. (Doc. 200). The undisputed facts establish that all of the accused devices have a cinch tube with a base end opposite a terminal end and that the terminal end at least partially closes, upon inflatable airbag deployment without obstruction, without necessitating closure of the base end of the cinch tube, within the meaning of the relevant claims of the '450 Patent. *Statements of Uncontested Facts* (Doc. 210-2) pp. 22-23, 25-26. When Autoliv's expert, Hendrik Helleman ("Helleman"), tested the accused devices, the terminal end closed while the base

end remained open. *Helleman Report*, at 66-68, 135-37.⁵ This could be observed by reference to the circle of stitches that attaches the base end of the cinch tube to the opening in the airbag membrane, which did not cinch closed. *Id.* at 67, 137.

Ms. Andreen does not dispute this finding at all with respect to the First Generation Airbags. Her report states that this limitation is not present in the Redesigned Airbags with a t-shaped guide mesh, and is silent on the First Generation Airbags with a +-shaped guide mesh. (Doc. 209-4) p. 73. The parties agree that Ms. Andreen's report "does not allege that Accused Products with a +-shaped guide mesh [the First Generation Airbags] satisfy the Base End Closure limitation." *Statements of Uncontested Facts* (Doc. 210-2) p. 26. Nor did Defendants' counsel expressly deny during oral argument that the First Generation Airbags infringe the Base End Closure Limitation.

With respect to the Redesigned Airbags, Ms. Andreen found that the *aperture* closes, but she did not find that the base end of the cinch tube around the aperture closes. Specifically, the cinch cord "causes the longer side of the cinch tube to be pulled over the guide mesh, closing the aperture at the base end of the cinch tubes." *Id.* at 27. She observed that the "inner surface of the long side of the tube . . . is pulled over the guide mesh." *Id.* She further observed that "the cinch tube, itself, blocks the base of the cinch tube in the airbag cushion, preventing outward flow of gases from the interior of the cushion." *Andreen Report* (Doc. 209-4) pp. 47-48. This was the factual basis for her opinion that that Redesigned Airbags do not infringe the Base End Closure Limitation. Moreover, she noted

⁵ This report was filed under seal. A hardcopy is available upon request to the Clerk of Court.

that tension on the cinch straps “causes the longer side of the cinch tube to be pulled over the guide mesh, closing the aperture at the base end of the cinch tubes.” *Id.* at 77. She did not assert that the base end of the cinch tube is cinched or constricted nor that its diameter is altered in any other way.

In other words, in all of the accused devices, the terminal end of the cinch tube restricts the flow of gas while the base end of the tube need not cinch closed, and thus is not required to overcome the surface tension of the fully-inflated airbag. Hyundai and Mobis challenge this conclusion in two ways. First, they attempt to reconstrue the Base End Closure Limitation to include both the base end of the cinch tube and the aperture that it circumvents. *Def.’s Opp’n to Summ. J.* (Doc. 219) p. 5. They concede that they are bound by the limitation’s plain and ordinary meaning. But their proffered constructions confound the plain and ordinary meaning of both the terms and the limitation as a whole. Second, they assert that genuine issues of material fact prevent a judgment of infringement because, during testing, Mr. Helleman observed the stitching that holds the base end of the cinch tube to the airbag membrane, rather than the base end itself. *Id.* at 8. But they misconstrue the expert testimony.

b. Construction of Base End Closure Limitation

Defendants first attempt to reconstrue the Base End Closure Limitation. They assert, “Autoliv is attempting to alter the term ‘closure’ from its plain and ordinary meaning to only include closure in the form of ‘cinching or other constriction.’” (Doc. 219) p. 8. They ask the Court to construe the term more broadly to include any obstruction of the airbag aperture that the base end circumvents, even where the structure of the base end of the

cinch tube remains open. *Id.* at 8. If that is what the limitation means, Defendants argue, then the base end of the tube in the Redesigned Airbags *does* close. *Id.* at 9-10. When the long edge of the cinch tube in the Redesigned Airbags flops over, it acts as a flap that fills the aperture within the base end of the cinch tube. *Andreen Report* (Doc. 209-4) pp. 47-48. Thus filled with tube material, they argue, the base end is closed. This argument fails because Defendants’ proposed claim construction is flawed in several respects.

First, Defendants lift the term “closure” out of context. The operative limitation is not “closure” but “without necessitating closure of the base end of the cinch tube.” Patent ’450 at col. 5 ll. 36-37. What need not be closed is not the cinch tube as a whole—indeed, some part of the cinch tube *must* be closed to serve its function—but rather the base end of the cinch tube in particular. The patent contemplates closure of the terminal end without requiring disruption of the shape or structure of the base end.

Second, when read in light of the function of the claims in which it appears, the Base End Closure Limitation must refer to closure by tightening, restricting, or cinching the structure of the fabric of the base end, or altering the shape or diameter of the base end structure in some other fashion. As Defendants themselves described it during claim construction litigation, the “terminal end is partially closed” while the “diameter and circumference of the base end [during cinching of the terminal end] remain unchanged from” before cinching. (Doc. 38) p. 12. The function of the cinch tube and cinch cord is to “tighten and restrict the cinch tube,” ’450 Patent at col. 2 l. 67, without having to overcome the surface tension of the inflating airbag cushion membrane, to which the base end is attached. Defendants described this function as the innovative aspect of the ’450 Patent

during inter partes review. They argued that the disclosed “cinch tube decouples the closure of the vent from the distension of the airbag cushion.” *Hyundai I*, Paper No. 41 at 10.

That function is achieved because, as Defendants earlier acknowledged, “the cinch tube must be able to close at its terminal end while not constricting at its base end, thus not requiring overcoming the tension in the airbag cushion material.” *Statements of Uncontested Facts* (Doc. 210-2) p. 23; (Doc. 45) pp. 19-20. They also acknowledged that this is what the ’450 Patent does that Inoue does not do. *Hyundai I*, Paper No. 41 at 10. It logically follows from Defendants’ own, earlier arguments and the function of the disclosed invention that “closure of the base end” refers to the kind of closure that would need to overcome the surface tension of the airbag membrane, such as pinching or cinching, not employing the terminal end as a kind of flap to cover the aperture in the airbag.

Third, the Base End Closure Limitation does not recite that the base end of the tube must remain open. It recites that the terminal end “at least partially closes . . . without necessitating closure of the base end.” Patent ’450 at col. 5 ll. 34-37. Whether or not the base end of one of the accused tubes sometimes closes, it is not *necessary* for it to do so because the cinch cord cinches the terminal end shut. Lack of closure of the base end is a sufficient, but not a necessary, condition of infringement. The *terminal end* cinches and constricts without requiring the base end to cinch or constrict. That is all the Base End Closure Limitation requires.

Fourth, Defendants misconstrue “base end of the cinch tube.” They interpret it to include both the fabric structure of the cinch tube itself *and* the aperture in the airbag membrane that it circumvents, i.e. the space that its circumference defines. Construed so

broadly, the base end can be said to be closed when some part of the cinch tube covers or fills the aperture as the cinch cord pulls it inward. But the claim does not recite *base end of the cinch tube and the aperture that it circumvents*. The base end of the cinch tube is part of the cinch tube, '450 Patent at col. 5 l. 22—i.e. the fabric that comprises the structure of the tube itself. By contrast, the aperture in the airbag membrane is what the base end of the cinch tube circumvents. *Id.* at col. 2 ll. 35-36. Thus the base end of the cinch tube may remain unclosed even as the cinched terminal end passes within the space defined by the circumference of the base end, effectively closing the aperture in the airbag membrane.

Indeed, that is precisely how the preferred embodiments of the '450 Patent function. When the terminal end of the cinch tube is closed it inverts and passes through the base end and thus obstructs the flow of gas through the airbag's aperture. '450 Patent at fig.2B. Defendants' proffered construction would exclude this preferred embodiment from the patent's coverage. A construction that excludes a patent's preferred embodiment is unsound. *Eko Brands, LLC v. Adrian Rivera Maynez Enters., Inc.*, 946 F.3d 1367, 1373 (Fed. Cir. 2020).

Furthermore, Defendants' proposed construction of "base end of the cinch tube" would introduce internal incoherence into the patent. The patent recites a "cinch cord coupled to the terminal end of the cinch tube." '450 Patent at col. 5 l. 24. That "terminal end" must be just the fabric of the tube, for the cord could not attach to the empty space within the terminal end's circumference—its aperture. Also, the patent repeatedly distinguishes between the terminal end and the aperture and holds them out as separate concepts. Defendants' construction would thus require the undersigned to hold that the

terminal end of the cinch tube is the fabric that comprises the structure of the tube but not its aperture, while the base end is the fabric structure of the tube and its aperture, without any textual support for that difference, and contrary to the plain meaning.

Defendants’ proposed construction would also make “base end” mean different things in different contexts. The base end of the cinch tube is attached to the membrane of the airbag. ’450 Patent at figs.2A, 2B, 3, and 4. That is how the cinch tube circumvents the aperture in the surface of the airbag membrane. *Id.* at col. 2 ll. 35-36. But again, one cannot attach material to an empty space. Nor can a structure simultaneously circumvent an opening and be the opening. For purposes of *circumventing* the aperture, the base end could not *include* the airbag’s aperture—the empty space within the circumference of the tube structure.

Defendants’ proffered construction of the Base End Limitation is contrary to the plain and ordinary meaning of the limitation’s terms. It lifts a term out of context, places the limitation in opposition to other intrinsic evidence, reads into the limitation a requirement that is not there, and construes its key term in such a way that the same word means different things in different contexts. As a matter of law, Defendants’ proffered construction is incorrect.

c. Undisputed Expert Findings

Defendants next attempt to generate a factual dispute in various ways. They first charge that Mr. Helleman provided no “analysis” of the base end of the cinch tube, “only the stitching in the body of the airbag adjacent to the cinch tube.” *Def.’s Opp’n to Summ. J.* (Doc. 219) p. 8. They argue that “it is impossible for the base end of the cinch tube to be

located in the ‘stitching surrounding the cinch tube’ because that region is part of the airbag cushion, not part of the ‘tubular structure’ that is the cinch tube.” *Id.* at 6. This false dichotomy ignores the obvious purpose of the stitching, which is to connect the base end of the cinch tube to the airbag cushion. At the stitching, the tube and the cushion membrane overlap. *Statements of Uncontested Facts* (Doc. 210-2) p. 25-26. That is why Mr. Helleman was able to determine the behavior of the base end of the tube by observing the behavior of the stitching. *Id.* at 24-26. And the same behavior indicates that the closure of the terminal end does not require that the surface tension of the airbag membrane be disturbed. That was the problem that Autoliv’s invention was created to solve.

Next, Defendants observe that the Base End Closure Limitation “says nothing about the stitching surrounding the stitch [sic] tube” in the accused devices. (Doc. 219) p. 7. This is incorrect for two reasons. First, where Mobis places the stitching is irrelevant to the ability of the cinch tube to restrict the flow of gas without necessitating closure of the base end. It happens that Mobis used stitching to attach the base end to the airbag cushion, so Mr. Helleman was able to infer the infringement by observing the stitching. But the stitching itself is irrelevant except insofar as it provided a point of reference for Mr. Helleman’s observation. Second, the stitching is not only located on the airbag cushion, as Defendants imply, but is also located on the surface of the base end of the cinch tube where it overlaps with and is sewn to the cushion. The cinch tube and the airbag cushion are sewn together by the stitching.

2. *Inversion Limitation Read Over the Accused Guide Mesh*

With respect to the Inversion Limitation, a dispute of material fact prevents entry of summary judgment for Defendants. The undisputed evidence shows that the cinch cords in the accused devices all pull the cinch tubes inward, toward the interior of the airbag, cinching them closed and by that means restricting the escape of gas when the airbag deploys without meeting an obstruction. Thus, “the configuration of the cinch tube and the length of the cinch cord enables the aperture to at least partially close, upon inflatable airbag deployment without obstruction,” just as the contested claims of the ’450 Patent recite. ’450 Patent at col. 5 ll. 38-41. However, there is a disputed issue of material fact as to whether “the terminal end is at least partially within the interior of the inflatable airbag cushion after the aperture becomes at least partially closed,” as the Inversion Limitation recites. *Id.* at col. 5 ll. 41-44. Defendants are therefore not entitled to summary judgment with respect to those claims.

Defendants argue that the guide mesh prevents infringement of the Inversion Limitation. As the cinch tube is pulled in by the cinch cord, the guide mesh arrests its inward progress. As a result, they argue, the tubes “close on the *outside* of the airbag.” (Doc. 202) p. 5. Because the relevant claims recite that, when cinched, the tube is “at least partially within the interior” of the airbag, there is no literal infringement.

Defendants misconstrue “partially within the interior.” The PTAB construed the Inversion Limitation to mean that “the terminal end of the cinch tube crosses the theoretical plane into the interior of the inflatable airbag cushion.” *Hyundai I*, Paper No. 54 at 11. The PTAB further explained that “[t]he ‘theoretical plane’ here would be the plane defined by

the aperture in the airbag from which the cinch tubes extend.” *Id.* at 11 n.5. So, the Inversion Limitation does not require the cinch tube to travel any particular distance into the interior of the airbag. It is enough that it crosses the plane formed by the aperture in the cushion membrane (the same aperture that the base end of the tube circumvents).

The evidence is sufficient to support a factual finding that the guide mesh is inside the aperture in the airbag cushion, and therefore on the interior of the theoretical plane. *Statements of Uncontested Facts* (Doc. 210-2) pp. 16, 23; *Helleman Report*, at 139. Ms. Andreen admits that “[t]he guide mesh is sewn on the *inside* of the airbag and is aligned to the circular opening in the airbag membrane at the base of each cinch tube.” *Andreen Report* (Doc. 209-4) p. 42 (emphasis added). It is undisputed that the guide mesh arrests the inward progress of the cinch tube by direct contact with the part of the cinch tube that is cinched by the cinch cord. *Statements of Uncontested Facts* (Doc. 210-2) p. 3. Witnesses from both sides testified that during full deployment, part of the cinch tube follows the cinch cord into the interior of the airbag as far as the guide mesh. *Id.* at 16-17.

For example, Mr. Helleman explained that

the cinch tube guide mesh itself is already within the interior of the airbag cushion. Thus, even if the cinch tube guide mesh prevented the terminal end of the cinch tube from going beyond the guide mesh (which it does not), the terminal end of the cinch tube would have already broken the plane of the airbag cushion by contacting the guide mesh, and would then be within the interior of the airbag.

Helleman Report, at 77. Based on his testing and observations of the accused products, Mr. Helleman further opined that “a portion of the terminal end of the cinch tube is pulled *through* the cinch tube guide mesh and into the interior of the airbag cushion.” *Id.* at 76.

Defendants and their expert contest that opinion because it rests on an inference; Mr. Helleman could not view the airbag from inside during deployment. But the weight of evidence supporting a factual inference is a question for the jury. *In Re Gabapentin Pat. Litig.*, 503 F.3d at 1261.

There is sufficient evidence that the terminal end of the closed cinch tube crosses the theoretical plane of the airbag membrane upon inflation without obstruction to send the question to the jury. *Statements of Uncontested Facts* (Doc 210-2) pp. 3, 16. That the guide mesh may prevent the tube from passing any *further* into the airbag does not avoid infringement as a matter of law.

3. *Terminal End Read Over the Extended Cinch Tubes*

a. Genuine Issue of Material Fact

Defendants argue that the extra material added to the end of the cinch tube in the Redesigned Airbags enables those devices to avoid infringement of the '450 Patent. They suggest that their Redesigned Airbags do not infringe the Inversion Limitation because “the end of the cinch tube does not get inverted in on itself during deployment.” (Doc. 202) p. 5. But that factual assertion is contested. Some testing evidence shows that the cinch cord inverts the tube and pulls it inward, just as the '450 Patent claims recite. *Helleman Report*, at 137-44.

b. Proper Construction of “Terminal End”

Defendants also argue that the Redesigned Airbags do not infringe the “Terminal End Limitation” because, with the additional material added to the end of the tube, the cinch cord is now attached “*to the middle* of the cinch tube, not at a ‘terminal end’ as the

claims require.” (Doc. 202) p. 7. Of course, this begs the question whether, by moving the cinch cord attachment relative to the length of the cinch tube, Defendants also moved the terminal end, which the ’450 Patent identifies as the part of the cinch tube whose aperture is circumvented by the cinch cord and closed by the cinch cord during full inflation. ’450 Patent at col. 5 ll. 24-26.

Autoliv contends that Defendants cannot “avoid an infringement finding” by adding “useless, extraneous fabric to the end of the tube.” *Pl. ’s Opp’n to Summ. J.* (Doc. 227) p. 4. But whether Defendants added the material only to avoid infringement or for some other purpose, such as to act as a flap, is irrelevant. The question is how to understand “terminal end.” The patent defines the terminal end by reference to two other elements. It is described as the part of the tube to which the cinch cord is coupled. ’450 Patent at col. 5 l. 24. And it is identified in contradistinction to the base end, which may remain open as the terminal end is cinched closed. *Id.* at col. 5 ll. 22-23, 34-37. By reference to the cinch cord and the base end, the part of the accused cinch tube that is closed by the cinch cord would be the “terminal end.” There are no other points of reference on the cinch tube as described in the patent. As Autoliv correctly notes, the patent makes no mention of a “middle” of the tube.

The claim construction rule of the case is that “terminal end,” like the other operative terms, be given its ordinary and plain meaning rather than a particular or technical construction. (Doc. 108). Because the closure of the terminal end solves the problem how to close the vent without requiring closure of the airbag vent hole that the base end of the tube circumvents, it seems clear that “terminal end” is meant to be understood in contrast to “base end,” and vice versa. In plain words, the terminal end is the part of the tube that is

not the base end. It is not attached to the surface of the airbag and therefore not affected by the inflating airbag's surface tension. And the base end is the part of the tube that is not the terminal end and is subject to the surface tension of the inflating airbag's membrane. The cinch cord does not circumvent it, and its aperture need not close during full inflation.

Defendants do not provide a satisfactory definition of "middle" which might exclude it from the "terminal end." Indeed, Defendants' own expert testified that, at least in some embodiments of the invention, "the terminal end is in the middle." (Doc. 183-1) p. 35. She identified the terminal end as the place where the "cinch cord [is] coupled to the terminal end of the cinch tube extending around the majority of the aperture of the terminal end." *Statements of Uncontested Facts* (Doc 210-2) p. 23. When asked to locate the terminal end on a drawing of a '450 Patent embodiment, she indicated that it starts at the far end of the tube opposite the airbag cushion and extends to below where the cinch cord is attached, reasoning that "the aperture needs to be in the terminal end, and the cinch cord coupled to the terminal end and extending around a majority of the aperture of the terminal end of the cinch tube." (Doc. 183-1) p. 33.

Likewise, the Redesigned Airbags have an aperture at the terminal end, which is defined and circumvented by the material structure of the cinch tube, and which is distinct from the aperture that the base end circumvents. The aperture surrounded by the base end is subject to the surface tension of the airbag membrane during full deployment. The aperture at the terminal end is not, which is why it can be cinched. Construing "terminal end" according to its plain and ordinary meaning, the evidence is sufficient to support a finding that the cinch cords in all accused products attach to the cinch tubes at some place

distant from the base end and cinch the cinch tube closed wherever they attach. *Helleman Report*, at 54-58, 121-26. From the facts presented, a jury could reasonably find that the cinch cords in Defendants' accused products are coupled to the terminal end of the cinch tubes. Defendants are therefore not entitled to summary judgment on this point.

4. *Claim 20 Read Over the Redesigned Airbags*

Even if the cinch cord in the Redesigned Airbags were attached to the middle of the cinch tube, the evidence is sufficient to raise a fact question whether those devices infringe claim 20 of the '450 Patent. Unlike claim 1, claim 20 does not recite a cinch cord "coupled to the terminal end." Instead, it recites "means for restricting gas venting by cinching the venting means to reduce the circumference of the venting means at a terminal end." '450 Patent at col. 8 ll. 13-15. This Court construed this limitation to include a function—restricting gas venting by cinching—and to disclose the cinch cord as the means. *Claim Const. Order* (Doc. 131) p. 7. Nothing in the claim requires the cinch cord to be attached to the terminal end, only that its function reduce the circumference of the cinch tube there.

The undisputed evidence shows that the cinch cords in the accused products at least sometimes reduce the circumference of the terminal end of the cinch tube during deployment. *Statements of Uncontested Facts* (Doc. 210-2) pp. 8-9, 12-13. After testing, Mr. Helleman found that "each of the Redesigned Cinch Tube Products contains a cinch cord designed to reduce the circumference of the venting means at a terminal end without necessitating closure of an opposing base end." *Helleman Report*, at 177. His examination of each accused Redesigned Airbag revealed a cinch cord "extending around a majority of the terminal end." *Id.* at 122. And schematics for each of the Redesigned Airbags confirmed

this finding in his opinion. *Id.* at 123-24. The evidence raises a genuine issue of material fact whether the accused cinch cords reduce the circumference of the cinch tube at the terminal end, within the meaning of claim 20.

5. *Diffuser Limitation Read Over the Tested Accused Airbags*

Reading the Diffuser Limitation over the accused airbags, some of which he examined and tested, Mr. Helleman found evidence of infringement. The airbags tested include a diffuser. *Helleman Report*, at 210-13, 267-71. During inflation, the cinch tube vents deploy past the diffuser. If the airbag encounters an obstruction then the cinch tubes remain in line with the diffuser and, as a result, gas rapidly exits through the open cinch tubes. *Statements of Uncontested Facts* (Doc. 210-2) pp. 11-14.

Defendants argue that Mr. Helleman “failed to perform testing that might show that the diffusers meet the specific configuration required by the claims.” (Doc. 202) p. 16. They fault him for failing to provide “actual measurements regarding the relative locations of the diffuser and the cinch tube vents” and “any data regarding the speed with which gas exits the cinch tube vent.” *Id.* at 16, 18-19. But the claim construction rule of the case is that terms be given their ordinary meaning. If Defendants thought that the terms “configured to redirect inflation gas” and “rapidly” should be given a technical or mathematical meaning as a matter of law, the time to litigate the question has long since passed.

The evidence is far from conclusive that the ordinary and customary meanings of those terms require precise mathematical calculations. Any fact disputes about how one skilled in the relevant art would evaluate the terms is for a fact finder. If judgment as a

matter of law were appropriate, it should be entered against Defendants who, as mentioned above, earlier persuaded the PTAB to adopt a non-technical, non-mathematical interpretation of the same terms, and whose expert interpreted the terms in an ordinary sense without mathematical precision.

Defendants next argue that Mr. Helleman's opinion about the location of the diffuser relative to the cinch tubes is speculative. Pointing to images of the tests conducted on their airbags, Defendants observe that the diffuser is located inside the airbag and was not directly observed during the tests. (Doc. 202) pp. 16-18. However, it is undisputed that Mr. Helleman explained his inferences by reference to his observations. *Statements of Uncontested Facts* (Doc. 210-2) pp. 12, 14-15. He also drew inferences from his examination of schematic drawings of accused products. *Id.* at 14. Any dispute about the persuasiveness or credibility of Mr. Helleman's opinion goes strictly to its weight and is a fact question for the jury.

6. Diffuser Limitation Read Over the "Simplified Diffuser"

Defendants note that Mr. Helleman tested airbags containing one type of diffuser but did not test those containing a different type, which the parties call a "simplified diffuser." (Doc. 202) p. 19. But that he did not test every accused device for infringement of every claim goes to the weight of the evidence. Both experts read the Diffuser Limitation over schematics and other evidence about the simplified diffuser. To the extent that they drew different inferences from those data, that leaves a dispute of material fact. *See In Re Gabapentin Pat. Litig.*, 503 F.3d at 1261-62.

7. *Construction of Fixed Vent Limitation*

Defendants do not deny that the accused devices have fixed vents. But they argue that, as a matter of law, their fixed vents do not “provide consistent venting of the airbag cushion” as the claim limitation recites. (Doc. 202) p. 20. Viewing the testing evidence “in the most favorable light,” they explain, “at most it is shown that the vents provide *some* venting during *some* deployments with obstruction.” *Id.* at 21.

Autoliv argues that Defendants misconstrue the Fixed Vent Limitation. The term “consistent” does not appear in the relevant claims. It appears in the specification to explain the function of the fixed vent. The specification is not the claim. Furthermore, they argue, Defendants had three prior opportunities to read “consistent” into the Fixed Vent Limitation. First, the parties litigated the issue before the PTAB and the Federal Circuit. Second, Defendants declined to litigate the question during the First Claim Construction. Third, because they failed to raise the matter earlier, this Court refused to render Defendants’ construction as a matter of law in the Second Claim Construction. Defendants now attempt a fourth bite at this apple.

All true. But in defending patentability during the inter partes proceedings, Autoliv committed itself to the construction for which Defendants now argue. Defendants did not act unreasonably in taking Autoliv’s construction as settled, especially since the Federal Circuit reversed the PTAB decision and concluded that the Fixed Vent Limitation is non-obvious precisely because the prior art did not “provide consistent venting.” *Autoliv*, 685 Fed. App’x. at 965. The issue is not, as Autoliv frames it, a matter of prosecution disclaimer or prosecution estoppel. The undersigned is called to construe relevant terms in

the patent claim. The undersigned finds persuasive Autoliv's earlier contention that the Fixed Vent Limitation should be read in light of its function to provide "consistent" venting, which is what distinguishes the Fixed Vent Limitation from prior art.

Seeming to appreciate that "consistent venting" is part of the Fixed Vent Limitation, Autoliv retreats to contest the meaning of "consistent." Here, Autoliv stands on solid ground. Defendants argue that to be "consistent," the fixed vents must consistently vent in multiple deployments that are not restricted by an occupant's position. (Doc. 202) p. 21. But the relevant comparators are not some unrestricted deployments versus other unrestricted deployments. The comparators are instead unrestricted deployments versus restricted deployments encountering an out-of-position occupant. As the Federal Circuit observed, the relevant prior art disclosed fixed vents that sometimes failed to vent altogether when the deploying airbag encountered an obstruction. *Autoliv*, 685 Fed. App'x. at 965. By contrast, Autoliv's fixed vent is consistent as between deployment with an obstruction and deployment without. This interpretation is confirmed by the claim language, which recites a "fixed vent disposed on the airbag and adapted to vent gas during airbag deployment with and without obstruction." '653 Patent at col. 12 ll. 11-12. Whether the fixed vents on the accused products behave in this way is a disputed issue of fact. *Statements of Uncontested Facts* (Doc. 210-2) pp. 10-15.

8. *Stitch Limitation Read Over Accused Devices*

Finally, Defendants argue that all of their accused airbags manufactured since they learned of the '653 Patent do not infringe the Stitch Limitation as it appears in claim 20. (Doc. 202) p. 21-24. After they became aware of the claim, Defendants removed the

releasable tack stitch that formerly held the folds of the air bag in place. They now enclose the airbag in a fabric cover that holds the airbag in a folded position until deployment, acting as a temporary holding feature. The cover does have stitching in it, but the stitching does not perform the work of a temporary holding feature. Defendants point out that claim 20 does not recite a holding feature that “*includes* stitching” but rather a feature that “*is* stitching.” (Doc. 202) p. 23.

Quoting the Federal Circuit, Autoliv argues that “[n]othing in the claims requires the releasable temporary holding feature to be directly on the particular fold.” *Pl.’s Opp’n to Summ. J.* (Doc. 227) p. 32 (quoting *Autoliv*, 685 Fed. App’x. at 966). But Autoliv lifts the quote out of context. The PTAB found claim 20 obvious, and the Federal Circuit agreed, because prior art recited the use of releasable stitching to hold a folded airbag in place until deployment. *Autoliv*, 685 Fed. App’x. at 966. To get around that holding, Autoliv attempted to further limit the Stitching Limitation to a device to create “a temporary bond between two portions of an airbag’s ‘cushion membrane’ in order to create a fold.” *Id.* The Federal Circuit rejected Autoliv’s attempt to “narrow the application of its preferred construction at this stage.” *Id.*

So, to the extent that Autoliv’s Stitching Limitation recites any use of stitching as a releasable holding feature, it is anticipated by prior art and unpatentable. To the extent that Autoliv wants to confine the claim to releasable stitching that attaches to folds in the airbag membrane, that interpretation is foreclosed by the Federal Circuit’s ruling. And, in any event, it does not read over Defendants’ devices, as Mr. Helleman acknowledged.

Statements of Uncontested Facts (Doc. 210-2) p. 18. Defendants are entitled to judgment that they are not literally infringing the Stitch Limitation of claim 20 of the '653 Patent.

C. Issues of Material Fact Concerning Multiple Damages

Defendants argue that “Plaintiff is not entitled to enhanced damages pursuant to 35 U.S.C. § 284 because any resulting infringement could not be considered ‘egregious.’” (Doc. 201) p. 3. Willfulness and other questions of intention are issues of fact for a jury. *See Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 811 (Fed. Cir. 2007). Here, the summary judgment record contains sufficient evidence from which a reasonable fact finder could find that Hyundai and Mobis either intended to infringe Autoliv’s patents or added material to their airbags that did not cure known infringements after they became aware of the patents. In particular, an executive officer of Hyundai testified that Hyundai Mobis knew of the '450 Patent before designing cinch tubes into some of its products, that its engineers reviewed at least one Autoliv patent during its patent review in 2011, just before changing the designs of its cinch tubes, and that designing around the '450 Patent was one motivation for the redesign efforts. (Doc. 228-26) pp. 13-16, 19. Summary judgment is therefore not appropriate as to enhanced damages.

VI. CONCLUSION

For the reasons stated above, the undersigned Magistrate Judge RECOMMENDS that Autoliv’s Motion for Partial Summary Judgment (Doc. 200) be GRANTED, ruling that the contested claims of the '450 Patent are non-obvious as a matter of law and that all of the accused airbags infringe the Base End Closure Limitation of the '450 Patent and every claim in which it appears. The undersigned further RECOMMENDS that

Defendants' Motion for Summary Judgment (Doc. 201) be GRANTED IN PART, resulting in judgment of non-infringement with respect to the Stitch Limitation of claim 20 read over the First Generation Airbags and Redesigned Airbags and all withdrawn claims, and that all other requests for summary judgment by Defendants be DENIED.

In particular, the undersigned RECOMMENDS that the propositions stated in the cross motions ought to be disposed of as follows.

(1) Plaintiff's proposed judgment that the accused products infringe the Base End Closure Element be GRANTED;

(2) Plaintiff's proposed judgment that the terms "a region" and "such that the gas rapidly exits" as found in U.S. Patent No. 7,614,653 are not indefinite be GRANTED;

(3) Plaintiff's proposed judgment that U.S. Patent No. 7,347,450 is not obvious, as prior art directed to parachute references is not analogous art be GRANTED;

(4) Plaintiff's proposed judgment that the asserted patents are not obvious over any ground where Defendants failed to identify a motivation to combine, as identified in Autoliv's Memorandum and Proposed Order, be GRANTED;

(5) Plaintiff's proposed judgment that the asserted patents are not obvious because Defendants failed to articulate a reasonable expectation of success in combining the prior art be GRANTED;

(6) Plaintiff's proposed judgment that claims 26-27, 35-37, and 40 of U.S. Patent No. 7,614,653 are not obvious or anticipated be GRANTED;

(7) Defendants' proposed judgment that Defendants' Redesigned Airbags do not infringe any claim of U.S. Patent No. 7,347,450, because there is no genuine dispute of

material fact that such products do not meet the limitation “a cinch cord coupled to the terminal end of the cinch tube and extending around a majority of the aperture of the terminal end of the cinch tube” be DENIED;

(8) Defendants’ proposed judgment that Defendants’ Redesigned Airbags do not infringe any claim of U.S. Patent No. 7,347,450, because there is no genuine dispute of material fact that such products do not meet the limitation “wherein the configuration of the cinch tube and the length of the cinch cord enables the aperture to at least partially close, upon inflatable airbag deployment without obstruction, such that the terminal end is at least partially within the interior of the inflatable airbag cushion after the aperture becomes at least partially closed,” be DENIED;

(9) Defendants’ proposed judgment that Defendants’ First Generation Airbags do not infringe any claim of U.S. Patent No. 7,347,450, because there is no genuine dispute of material fact that such products do not meet the limitation “wherein the configuration of the cinch tube and the length of the cinch cord enables the aperture to at least partially close, upon inflatable airbag deployment without obstruction, such that the terminal end is at least partially within the interior of the inflatable airbag cushion after the aperture becomes at least partially closed,” be DENIED;

(10) Defendants’ proposed judgment that Defendants’ Redesigned Airbags and First Generation Airbags do not infringe claims 26, 35-37, and 40 of U.S. Patent No. 7,614,653 (collectively, the “Diffuser Claims”), because Plaintiff has not come forward with evidence that would show that such products meet the limitation of a “diffuser configured to re-direct inflation gas to the closeable vent from an inflator such that the gas rapidly exits the

inflatable airbag cushion via the closeable vent when deployment of the airbag is obstructed,” be DENIED;

(11) Defendants’ proposed judgment that Defendants’ PAB model numbers 80310-M6000, 80310-M7000, 80300-J6000 do not infringe the Diffuser Claims, because Plaintiff has not come forward with evidence that would show that such products meet the limitation of a “diffuser configured to re-direct inflation gas to the closeable vent from an inflator such that the gas rapidly exits the inflatable airbag cushion via the closeable vent when deployment of the airbag is obstructed,” be DENIED;

(12) Defendants’ proposed judgment that Defendants’ Redesigned Airbags and First Generation Airbags do not infringe claims 27 and 40 of U.S. Patent No. 7,614,653, because Plaintiff has not come forward with evidence that would show that such products meet the limitation of “a fixed vent disposed on the airbag and adapted to vent gas during airbag deployment with and without obstruction,” be DENIED;

(13) Defendants’ proposed judgment that Defendants’ Redesigned Airbags and First Generation Airbags do not infringe claims 26 and 27 of U.S. Patent No. 7,614,653, which depend from claim 20, because there is no genuine dispute of material fact that such products do not meet the limitation “wherein the releasable temporary holding feature is stitching,” be GRANTED;

(14) Defendants’ proposed judgment that Defendants’ PAB model numbers 84530-B2500, 84530-E4500, 84530-H9500, 84530- H8500, and 80310-S2000 do not infringe the Diffuser Claims, because Plaintiff has not shown that such products meet the limitation of having a “diffuser configured to re-direct inflation gas to the closeable vent from an inflator

such that the gas rapidly exits the inflatable airbag cushion via the closeable vent when deployment of the airbag is obstructed,” be DENIED;

(15) Defendants’ proposed judgment that Defendants’ Redesigned Airbags and First Generation Airbags do not infringe claims the Withdrawn Claims, because Autoliv has failed to come forward with evidence sufficient to establish a genuine issue of material fact as to the infringement of these claims, is MOOT; and

(16) Defendants’ proposed judgment that Plaintiff is not entitled to enhanced damages pursuant to 35 U.S.C. § 284, because any resulting infringement could not be considered “egregious,” be DENIED.

Finally, it is ORDERED that the parties shall file any objections to this Recommendation on or before **March 12, 2021**. A party must specifically identify the factual findings and legal conclusions in the Recommendation to which each objection is made; frivolous, conclusive, or general objections will not be considered. Failure to file written objections to the Magistrate Judge’s findings and recommendations in accordance with the provisions of 28 U.S.C. § 636(b)(1) shall bar a party from a de novo determination by the District Court of legal and factual issues covered in the Recommendation, and waives the right of the party to challenge on appeal the District Court’s order based on unobjected-to factual and legal conclusions accepted or adopted by the District Court except upon grounds of plain error or manifest injustice. *Nettles v. Wainwright*, 677 F.2d 404 (5th Cir. 1982); 11TH CIR. R. 3-1; *see also Stein v. Lanning Securities, Inc.*, 667 F.2d 33 (11th Cir. 1982); *Bonner v. City of Prichard*, 661 F.2d 1206 (11th Cir. 1981) (en banc).

DONE this 26th day of February, 2021.

A handwritten signature in black ink, appearing to read 'Stephen M. Doyle', written over a horizontal line.

Stephen M. Doyle
CHIEF U.S. MAGISTRATE JUDGE